UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 23503

CSAH NO. 25

OVER THE

ROOT RIVER

DISTRICT 6 - FILLMORE COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 149)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The concrete of the substructure unit inspected at Bridge No. 23503, Pier 2, was found to be in good condition with no defects of structural significance observed. A scour depression approximately 3 feet deeper than the surrounding channel bottom was detected at the upstream nose of Pier 2. The pier footing was exposed with some undermining detected. The channel bottom appeared stable with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) The submerged concrete of Pier 2 was in good and sound condition with only random light scaling observed from the top of the footing to 1 foot above the waterline.

(B) Two impact related voids were also observed on the upstream nose of Pier 2 above the waterline, 2 feet long by 1 foot wide by ½ inch maximum penetration.

(C) The footing of Pier 2 was exposed along the entire perimeter with a maximum vertical exposure of 4 feet at the midpoint of the upstream end with a 1 foot long section with undermining ½ inch high by 3 inches deep.

(D) A light accumulation of timber debris was observed hanging at the waterline at the upstream nose of Pier 2. Also, a moderate accumulation of debris was observed on the scour depression from the channel bottom up 3 feet.

(D) A scour depression was observed at the upstream end of Pier 2 with a radius of 3 feet and a depth of 3 feet.

RECOMMENDATIONS:

(A) Monitor the scour depression and footing exposure at Pier 2 during future inspections. If these conditions progress, repairs can be considered including filling the scour hole at the upstream end of Pier 2 by designing and placing properly sized riprap.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 23503

Feature Crossed: Root River

Feature Carried: CSAH No. 25

Location: District 6 - Fillmore County

Bridge Description: The bridge superstructure is a four span, multiple steel girder bridge. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The piers and abutment footings are supported by timber piles. The piers are numbered 1 through 3 starting at the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 25, 2007

Weather Conditions: Sunny, 60°F

Underwater Visibility: 3.0 feet

Waterway Velocity: 2.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 2 and 3.

General Shape: The pier consists of a rectangular concrete shaft with rounded ends supporting a hammerhead pier cap and founded on a rectangular pile supported footing.

Maximum Water Depth at Substructure Inspected: Approximately 7.9 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the south end of Pier 2.

Water Surface: The waterline was approximately 16.8 feet below reference.
Waterline Elevation = 734.5.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code J/92

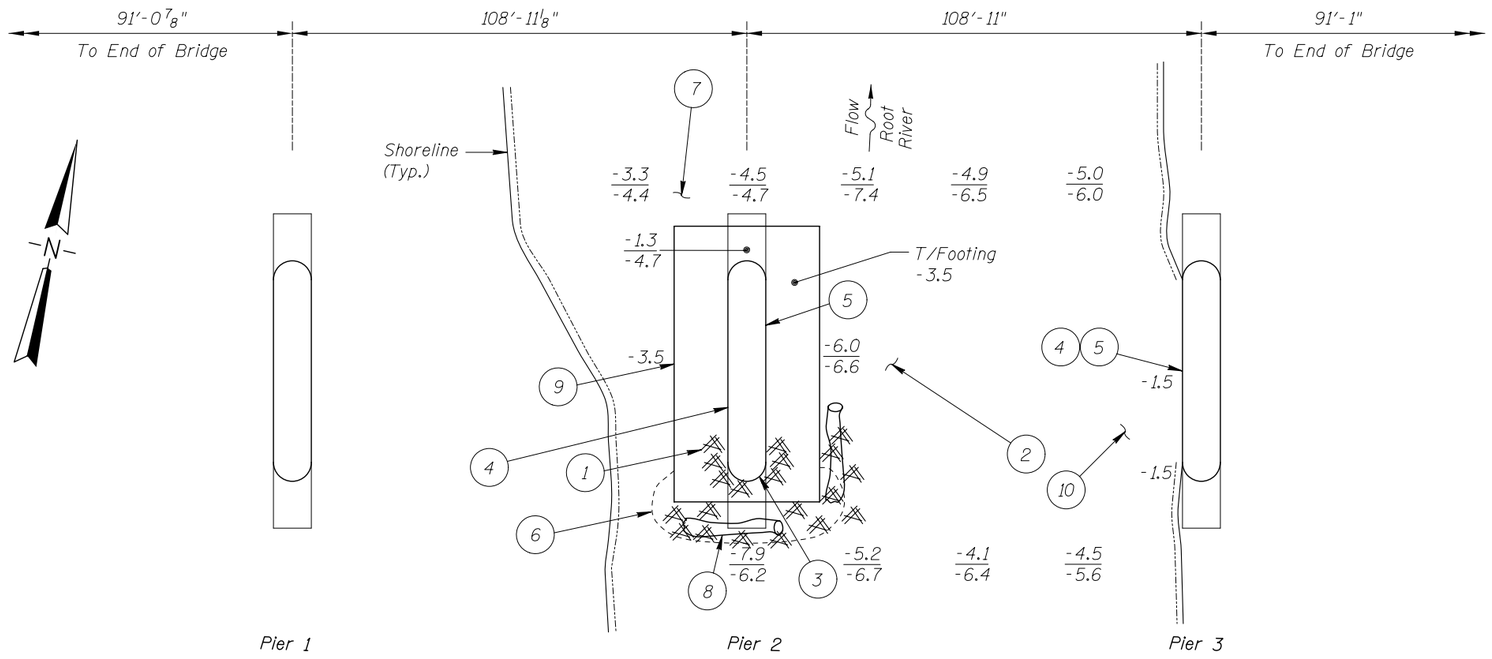
Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____Yes X No

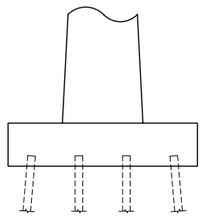
Photograph 1. Overall View of the Structure, Looking Southeast.

Photograph 2. View of Pier 2, Looking Northeast.

Photograph 3. View of Pier 3, Looking Northeast.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 2 and 3 were inspected underwater.
2. At the time of inspection on October 25, 2007, the waterline was located approximately 16.8 feet below the top of the pier cap at the upstream end of Pier 2. This corresponds with a waterline elevation of 734.5.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) A light accumulation of timber debris consisting of 2 inch diameter and smaller branches was observed at the upstream nose of Pier 2 at waterline.

(2) The channel bottom material consisted of fine sandy gravel with 2 inches of maximum probe rod penetration.

(3) Two horizontal impact related voids were observed on the upstream nose of Pier 2 above the waterline, 2-foot-long by 1-inch-wide with 1/2 inch of penetration and exposed aggregate.

(4) Light scaling of concrete was observed from the top of the footing (or from channel bottom at Pier 3) to 1 foot above the waterline, 1/4 inch maximum penetration.

(5) The concrete of both piers was smooth and in good condition.

(6) A 3-foot-radius, 3-foot-deep scour depression was observed at the upstream end of Pier 2.

(7) The channel bottom at the downstream end of Pier 2 consisted of sandy infilling with 3 inch probe rod penetration.

(8) A moderate accumulation of timber debris, up to 1.5 feet diameter, was observed within the scour depression at the upstream end and along the east face of the pier, extending from channel bottom up 3 feet.

(9) The footing was exposed along the entire perimeter of Pier 2 with a maximum vertical exposure of 4 feet at the midpoint of the upstream end with a 1 foot long section with undermining 1/4 inch high and 3 inch maximum penetration. Vertical exposure at the southwest corner was 2.5 feet, at southeast corner was 3 feet, along east face was 2.5 feet, and at the downstream end was 6 inches.

(10) The channel bottom at Pier 3 consisted of sandy silt with a maximum probe rod penetration of 6 inches.

Legend

-4.0 Sounding Depth (10/25/07)
-4.1 Sounding Depth (10/3/02)

Timber Debris

Note:

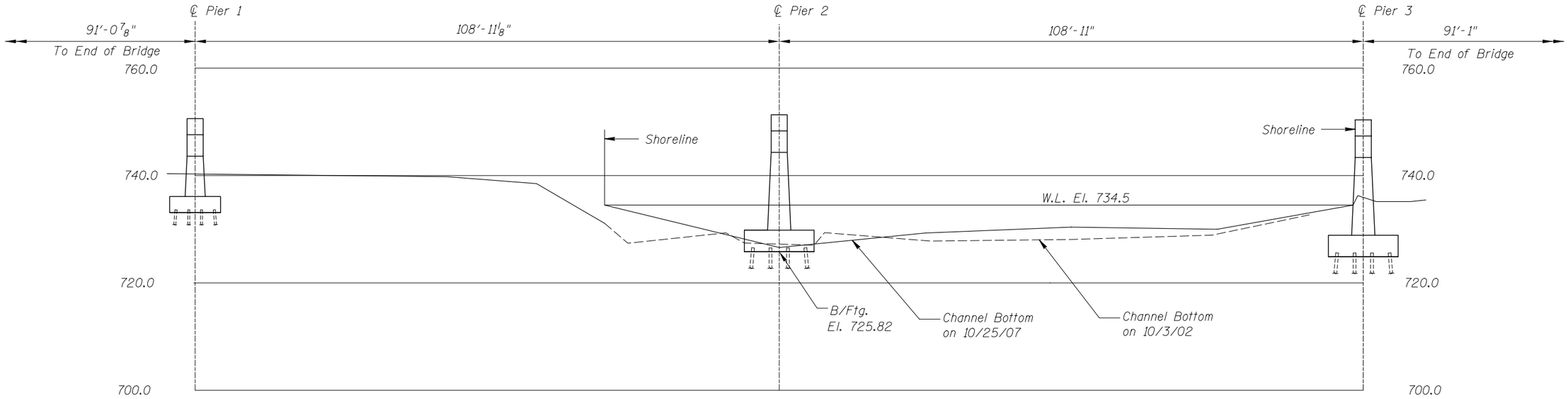
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

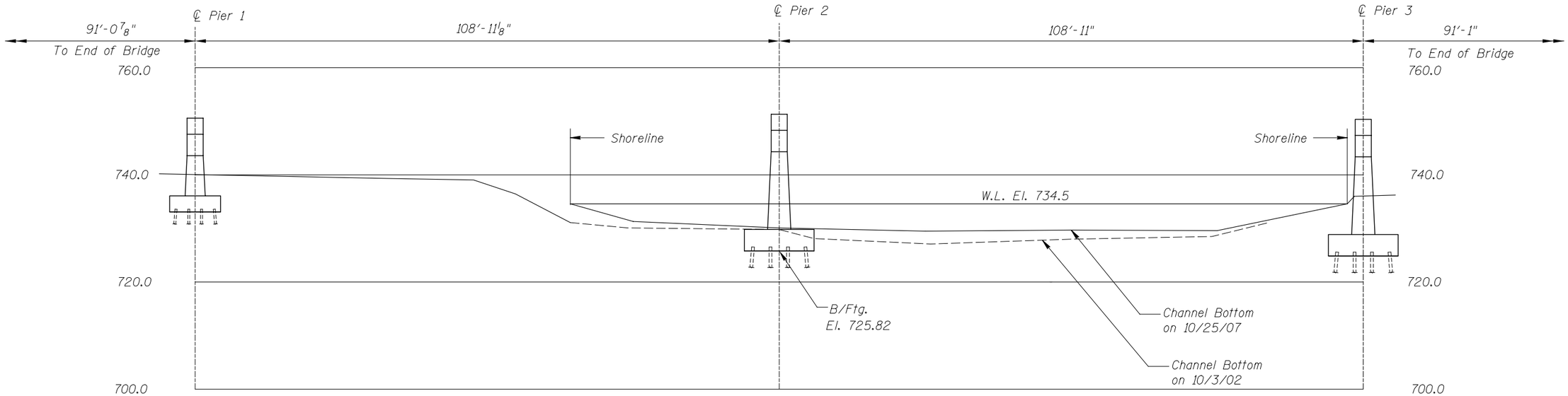
STRUCTURE NO. 23503
OVER THE ROOT RIVER
DISTRICT 6, FILLMORE COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: LJ	COLLINS ENGINEERS, INC 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: VR		Scale: NTS
Code: 52210149		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: LJ	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: VR		Scale: 1"=20'
Code: 52210149		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 25, 2007
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.
BRIDGE NO: 23503 WEATHER: Sunny, 60° F
WATERWAY CROSSED: Root River
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: Clayton G. Brookins, Valerie Roustan
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Camera
TIME IN WATER: 12:55 p.m.
TIME OUT OF WATER: 1:25 p.m.
WATERWAY DATA: VELOCITY 2.5 f.p.s.
VISIBILITY 3.0 feet
DEPTH 7.9 feet maximum at Pier 2
ELEMENTS INSPECTED: Piers 2 and 3
REMARKS: The concrete was in good condition with light scaling observed from the top of the footing to 1 foot above the waterline, ¼ inch maximum penetration. Two impact related voids were also observed on the upstream nose of Pier 2 above the waterline. The footing of Pier 2 was exposed along the entire perimeter with a maximum vertical exposure of 4 feet at the midpoint of the upstream end with a 1 foot long section with undermining ½ inch high by 3 inches deep. A light accumulation of timber debris was observed hanging at the waterline at the upstream nose of Pier 2. In addition a moderate accumulation of debris was observed on the scour depression from the channel bottom up 3 feet.

FURTHER ACTION NEEDED: X YES _____ NO

Monitor the scour depression and footing exposure at Pier 2 during future inspections. If these conditions progress, repairs can be considered including filling the scour hole at the upstream end of Pier 2 by designing and placing properly sized riprap.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 23503
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Root River

INSPECTION DATE October 25, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 2	7.9’	N	7	7	9	N	7	6	N	N	7	6	7	N	N	N	N	N
	Pier 3	1.5	N	7	N	9	N	7	8	N	N	N	8	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete was in good condition with light scaling observed from the top of the footing (or channel bottom at Pier 3) to 1 foot above the waterline with ¼ inch maximum penetration. Two impact related voids were also observed on the upstream nose of Pier 2 above the waterline. The footing of Pier 2 was exposed along the entire perimeter with a maximum vertical exposure of 4 feet at the midpoint of the upstream end with a 1 foot long section with undermining ½ inch high by 3 inches deep. A light accumulation of timber debris was observed hanging at the waterline at the upstream nose of Pier 2. In addition a moderate accumulation of debris was observed within the scour depression extending from the channel bottom up 3 feet.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.